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Local Application of:

GILLES DUMONT

Serial No.: 10/797,806

Art Unit: 3643

Filed: March 10, 2004

Examiner: ---

Title: ROTARY PLANT GROWING APPARATUS

September 13, 2004

Commissioner for Patents  
Alexandria, VA 22313-1450

CERTIFIED COPY OF PRIORITY DOCUMENT

S I R:

In the matter of the above identified application, Applicant herewith encloses  
Certified Copies of the priority documents, namely Canadian Patent Applications  
Serial Number 2,421,389 filed March 10, 2003 and Serial Number 2,431,523 filed  
June 9, 2003.

Respectfully,

A handwritten signature in cursive script, appearing to read "Eric Fincham".

Eric Fincham  
Reg. No. 28,201

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Specification and Drawings, as originally filed, with Application for Patent Serial No:  
**2,431,523**, on June 9, 2003, by **GILLES DUMONT**, for "Rotary Plant Growing  
Apparatus".

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Agent certificateur/Certifying Officer

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Canada

(CIPO 68)  
31-03-04

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## ROTARY PLANT GROWING APPARATUS

The present invention relates to a plant growing apparatus of the type wherein a cylindrical drum like structure rotates about a light source.

The field of growing plants using lamps is well known in the art and many systems have been proposed. In order to overcome this, in Canadian Patent 2,343,254, there is disclosed a system wherein the plant apparatus is in the form of a drum which rotates about a light source to thereby maintain a constant distance between the plants and the lamp. The drum is rotated and there is provided a water feeding basin located at the bottom into which the plants, in a pot, are provided with nutrients.

While such an apparatus has indeed been found to be suitable for the purpose of growing plants, the structure of the same is somewhat complex.

One of the problems of the prior art systems is the distance between the light source and the plants which are growing. As there must be sufficient room for the plants to grow, the light source must be a certain distance away from the plants. While this is suitable when the plants are substantially fully grown, as the light intensity is sufficient for leaves which are near the light source, it does present a problem when the plants are very young since the light intensity diminishes substantially with an increasing distance therefrom. A further problem inherent in such apparatuses is the feeding of the plants. As aforementioned, when the structure rotates and a portion thereof is immersed in the liquid, a problem of dripping of the liquid over the base and even outside the base structure arises.

According to the present invention, there is provided an apparatus which overcomes at least some of the problems associated with such prior art apparatuses.

An embodiment of the present invention is illustrated in the accompanying drawings to which reference will now be made and in which:

Figure 1 is a perspective view of one embodiment of an apparatus according to the present invention wherein the apparatus is in its compact smaller configuration;

Figure 2 is a perspective view of the apparatus of Figure 1 in an expanded configuration;

Figure 3 is a side elevational view of the apparatus of Figure 2;

Figure 4 is a plan view of one of the rig segments used in the rotating drum structure;

Figure 5 is a perspective view thereof;

Figure 6 is a side elevational view illustrating securement of two ring segments when the apparatus is in its smaller compact configuration;

Figure 7 is a view similar to Figure 6 when the ring is in its full expanded configuration;

Figure 8 is a perspective view of a portion of the structure showing provision of means for supplying nutrients and fluid to the plant containers;

Figure 9 is a side elevational view of an apparatus according to the present invention;

Figure 10 is an end perspective view a portion of a further embodiment of an apparatus according to the present invention, with portion thereof being removed for clarity;

Figure 11 is a view similar to Figure 10 with end panels removed;

Figure 12 is a end elevational view of the apparatus of Figure 11;

Figure 13 is a perspective view of a still further embodiment of an apparatus according to the present invention, again with portions removed for purposes of clarity;

Figure 14 is an enlarged view of a plant retaining members utilized in the embodiment of Figure 13;

Figure 15 is a perspective view of portions of a modified apparatus similar to the apparatus of Figure 13;

Figure 16 is a view similar to that of Figure 15, with plant retaining members being mounted thereon; and

Figure 17 is an end elevational view of a portion of a drive system which may be employed with the apparatus.

Referring to the drawings in greater detail, and by reference characters thereto, there is illustrated a rotary drum plant growing apparatus which is generally designated by reference numeral 10.

Apparatus 10 includes first and second side frames 12 and 20. First side frame 12 includes a base member 14 with a pair of diagonal supports 16 and 18 extending upwardly from opposed ends thereof. Similarly, side frame 20 includes a base 22 having diagonal supports 24 and 26. Extending between side frames 12 and 20 is a longitudinal frame member 28.

The apparatus includes a plurality of transversely extending containers generally designated by reference numeral 32 which are mounted on a rotating ring generally designated by reference numeral 34. Ring 34 is comprised of a plurality of ring segments generally designated by reference numeral 36. In the embodiment of Figure 1, there are six ring segments 36 while in the embodiment of Figure 2, there are provided eight ring

segments.

The ring segments 36 are illustrated in greater detail in Figures 4 to 7 and reference will now be had thereto. Each ring segment includes a base 38 and a pair of opposed side walls 40 and 42. As may be seen in Figure 4, base 38 includes a plurality of rectangular apertures 44 and a plurality of projections 46.

Located at one end of each ring segment 36, and secured to the side walls 40 and 42, is a connecting portion 48. As may be seen in Figures 5, 6 and 7, each connecting portion includes a lower aperture 50 and an upper slot 52 for reasons which will become apparent hereinbelow. A plurality of pins 53 are provided at the other end of side walls 40 and 42.

Each transversely extending container 32 includes a base portion 54 which has a plurality of slot like apertures 56 formed therein. From one side of base 54, there is provided an upwardly extending wall 58 having an inwardly extending flange 60. At the other side of base 54, there is provided a second side wall 62 also having an inwardly extending flange 64. The arrangement is such that plant growth medium may be placed within the transverse container 32.

The apparatus 10 includes an electric motor 66 driving a belt 68 which in turn drives a drive roller 70 in contact with ring 34. It will be noted that drive roller 70 includes a pair of lateral guides 72 to ensure that the rotating ring does not move sidewardly. Similarly, there are provided guide rollers generally designated by reference numerals 74 and 75 and which are not driven, but which are useful to stabilize the rotating drum. For purposes of clarity, some of the drive rollers do not have their connecting structure shown; it will be understood that appropriate connection to frame members will

be provided.

Connected to side frame 20 is a vertically extending arm 76 and which carries a support arm 78. This is utilized to support a weir 82 which has a plurality of dispensing members 80 secured thereto and which dispensing members 80 are designed to provide a fluid (water and/or nutrients) through slot apertures 56 to the plant growth medium within transversely extending containers 32.

The arrangement is such that the ring 34 may be comprised of, in the illustrated embodiment, six or eight ring segments. When the ring is formed of six segments as shown in Figure 1, the apparatus is more compact and thus the plants within transversely extending container 32 will be closer to the light source which is in the center of the drum. When expanded, the drum assumes a more circular configuration and the plants will be further spaced from the light source. As will be seen, the arrangement is such that pins 53 fit within lower aperture 50 and upper slot 52. The configuration of upper slot 52 allows for movement of the pin therein.

The light source has not been shown for purposes of clarity but it will be understood that a conventional light source such as is illustrated in Canadian Patent 2,343,254 may be utilized.

In the embodiment of Figure 9, there is shown a portion of a modified form of the apparatus and which apparatus is generally designated by reference numeral 110. Apparatus 110 includes a top frame member 112, a bottom frame member 114, and a pair of side frame members 116, 118. An inverted U shape member 120 is secured to a hanger 122 which in turn hangs about top frame member 112. Member 120 has a pair of downward extended arms 123, 125 which is designed to support ring 124. This said,

many different means may be utilized including roller members supporting an outer portion of the ring 124.

Ring 124 is of the segmented type previously described and in this instance, includes a plurality of transversely extending containers 126. In this embodiment, containers 126 are of a circular configuration having a slit (not showing) from therein to permit plant growth.

For rotating the ring 124, there is provided a sprocket 128 which is suitably connected to a drive means (not shown). A pair of guide means 130, 132 may be provided at either side of ring 20, 24 and suitably mounted to side frame members 116, 118 respectively.

A still further embodiment of the present invention is illustrated in Figures 10 to 12 and reference will now be made thereto.

An apparatus generally designated by reference numeral 140 includes U shape frame assemblies 142 and 144 mounted at either side. A plurality of a support and drive members 146 may be provided for a rotatably supporting a rotating drum assembly generally designated by reference numeral 145. Drum assembly 145 is comprised of an outer drum 148 and an inner drum 150 spaced therefrom. In this regard, support and drive means 146 may be any suitable and accordingly are not described in detail herein. They may serve to only support the drum assembly 145 with separate drive means being provided or one or more of the means 146 may be utilized to a rotatably drive drum assembly 145.

As shown in Figure 11, there are provided a plurality of generally rectangular transversely extending containers 154 each having slits 152 therein to permit plant growth

therethrough. Containers 154 may be utilized to contain a growing medium. An end panel 158 is provided along with a nutrient feed tube 160. In this embodiment, a very fine vapor or spray is provided through tube 160 to the space intermediate outer drum 148 and inner drum 150. As the drum rotates, nutrient feed may be provided through tube 160 through suitable apertures (not shown) in end panel 158. Alternatively, there are many known mechanisms for feeding the nutrient solution to the space between the two drums. Again, as is conventional, a light source 156 is provided interiorly of inner drum 150.

A still further embodiment of the present invention is shown in Figures 13 to 16 and will now be described.

The embodiment of Figure 13 is similar to the embodiment of Figure 10 in that apparatus 170 includes a pair of U-shape frames 172, 174. The support/drive means 176 are utilized to drive a drum comprised of an outer drum 178 and an inner drum 180. However, in this embodiment, they are provided apertures (not shown) within inner drum 180 and which are designed to receive a plant receiving element 182.

Plant receiving element 182 is illustrated in greater detail in Figure 14 and as may be seen, comprises a base portion 184, and an upper portion 186. Extending therethrough is an aperture 188 while a slit 190 extends through the side walls to aperture 188. In use, a young plant may be inserted through aperture 188 and since plant receiving element 182 is formed of a resilient compressible material, plant growth is permitted. It will be understood that suitable means are provided for retaining plant receiving element 182 within the aperture of inner drum 180. Thus, plants receiving element 182 may be formed of a foam material.

The embodiment of Figures 15 and 16 is similar to that of Figures 13 and 14 and

accordingly, similar reference numerals will be employed. In this embodiment, inner drum 180 is provided with a plurality of rectangular plant receiving apertures 194 each designed to received a plant receiving element 196. As may be seen in Figure 16, plant receiving elements 196 have a pair of apertures 198 from therein along with a pair of slits 200. Naturally, many different configurations can be utilized with the present invention.

Turning to Figure 17, there is illustrated a drive means which may be used for any of the apparatuses of the present invention. In this drive device, there is provided a sprocket wheel 204 which engages aperture 205 formed in the outer drum or outer ring.

It will be understood that the above described embodiments are for purposes of illustration only and that changes or modifications may be made thereto without departing from the spirit and scope of the invention.

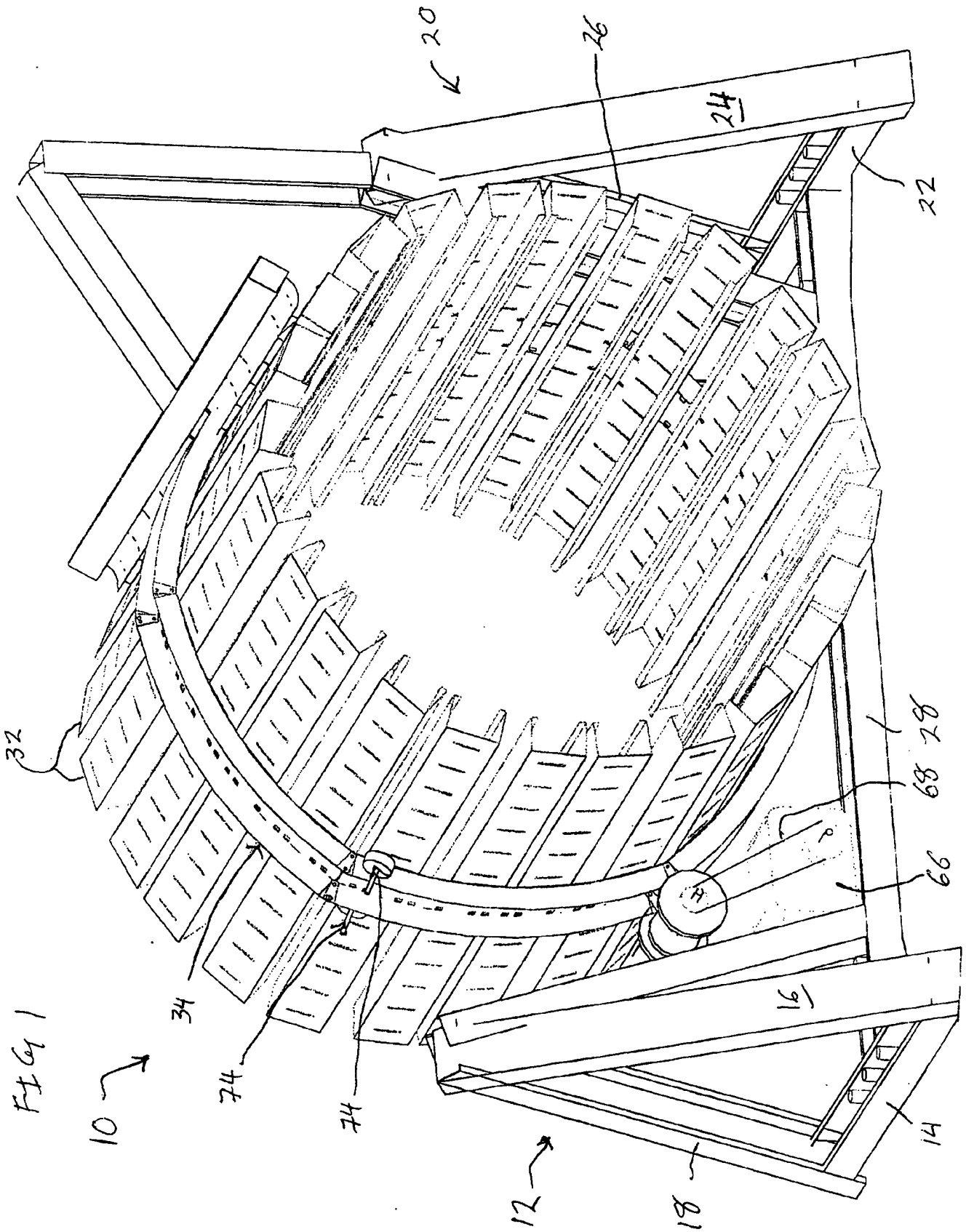
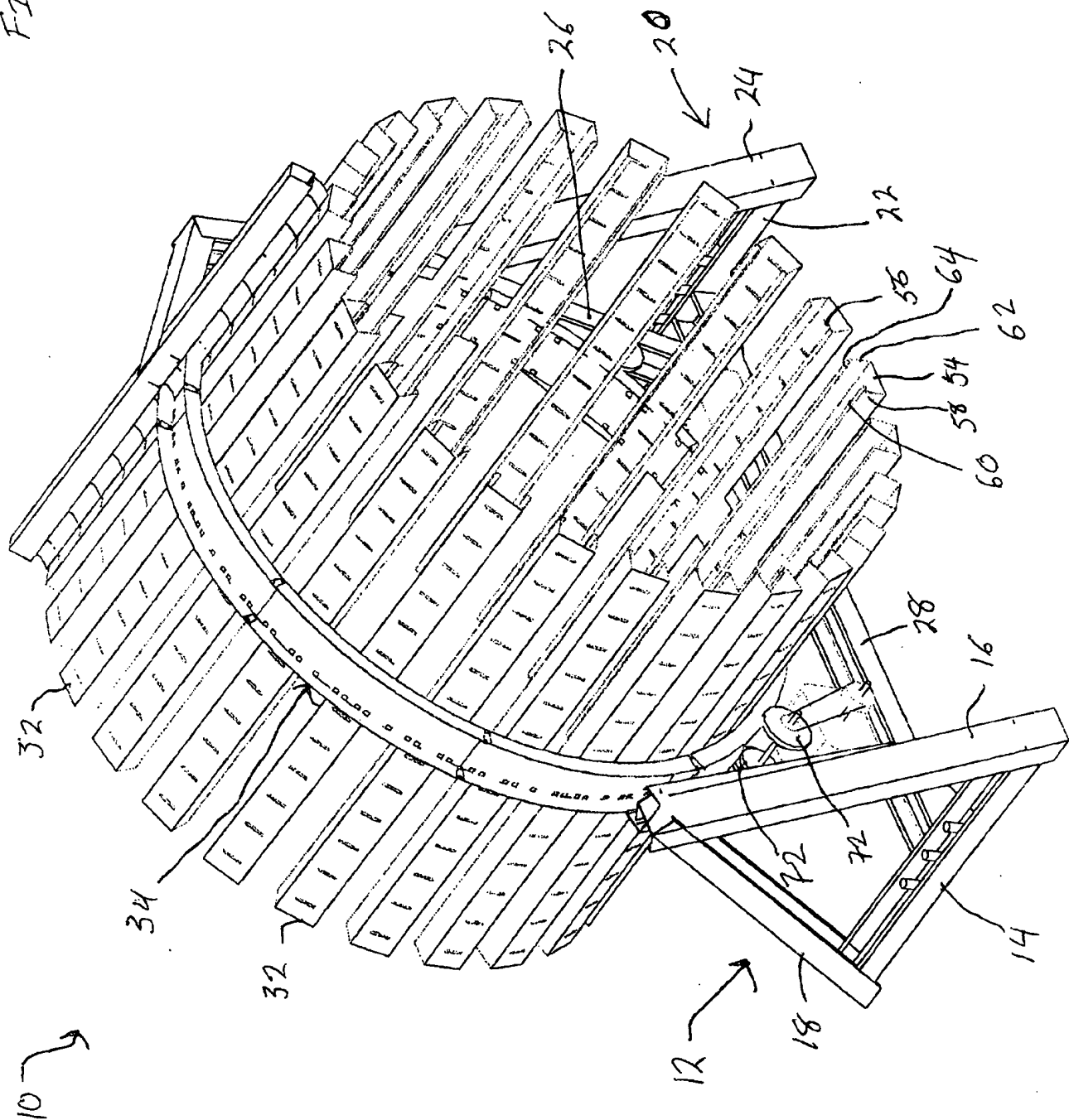


FIG 2



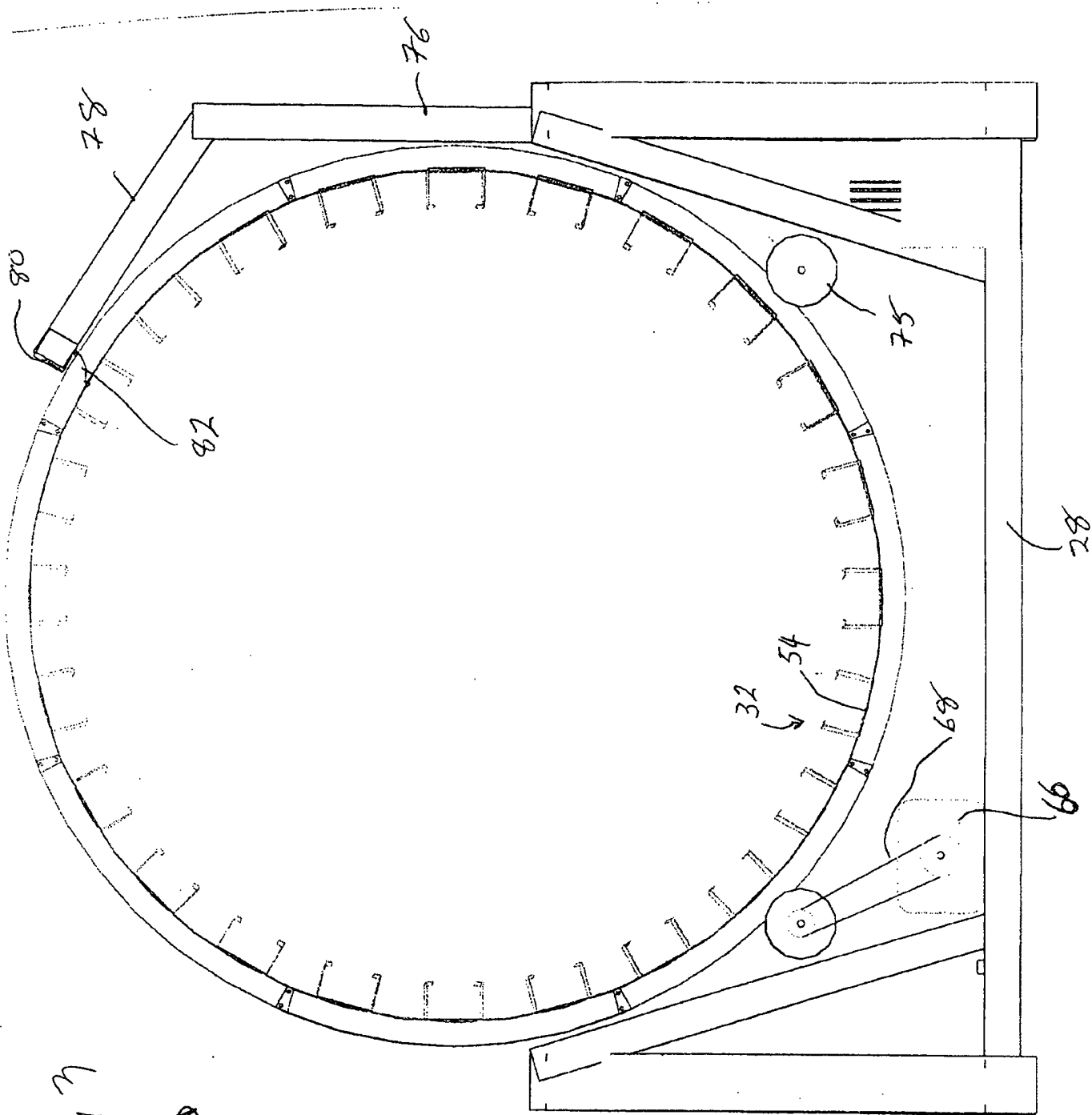


FIG 3  
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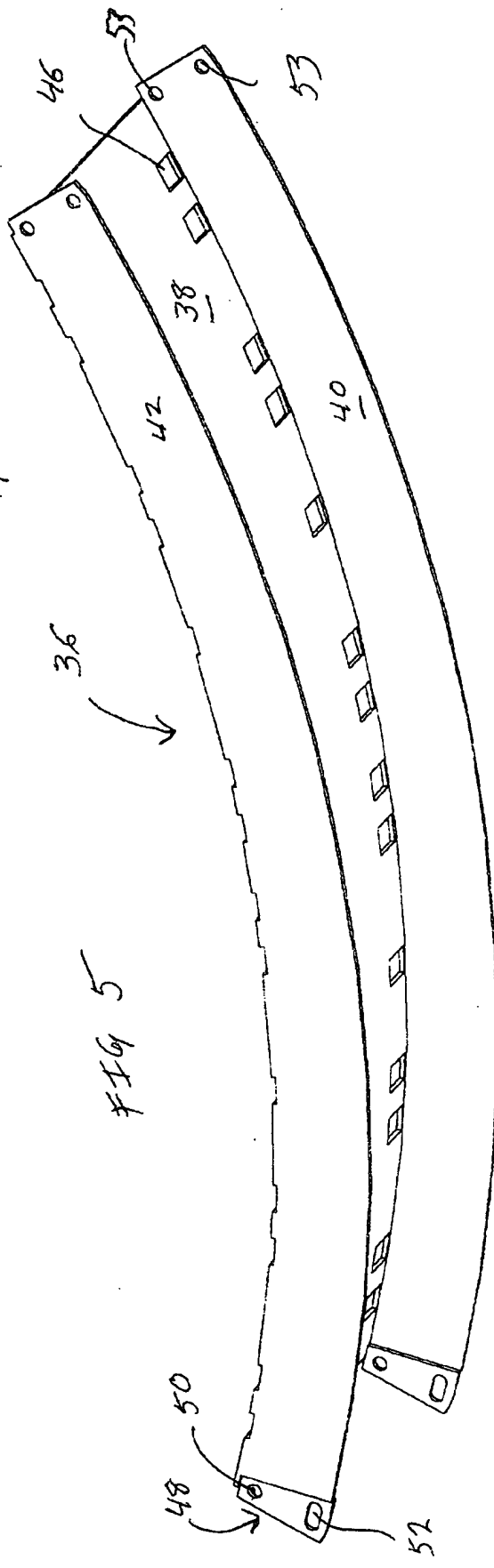
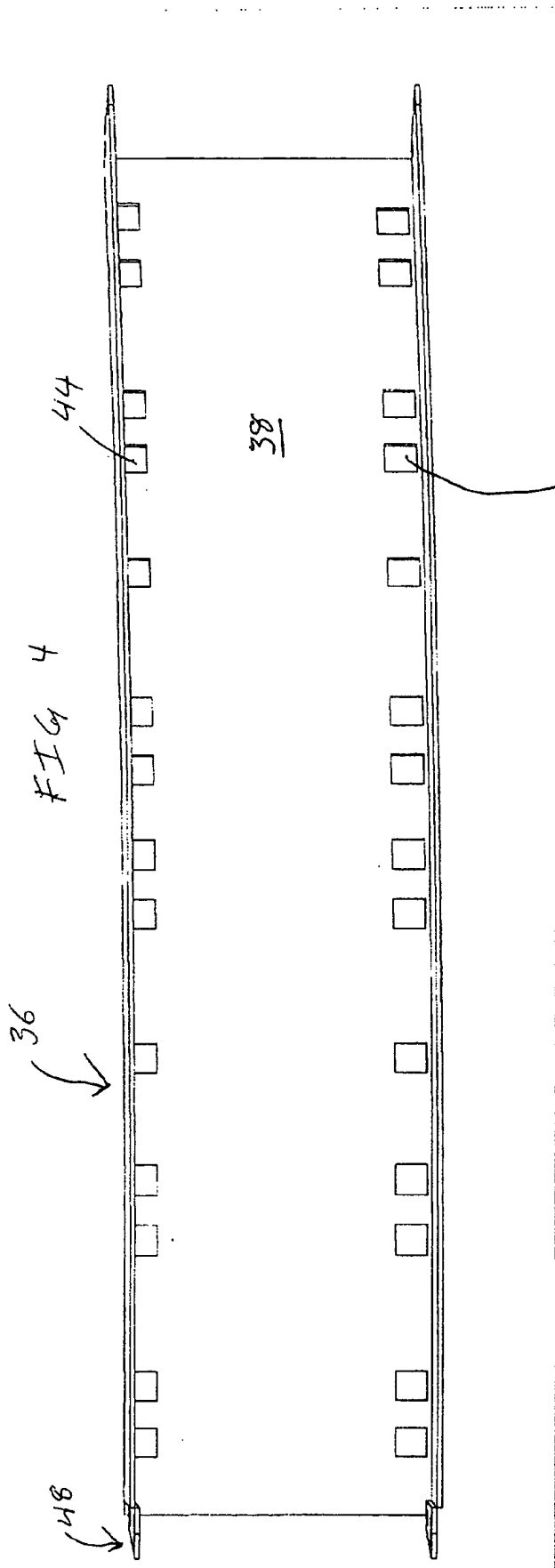


FIG 6

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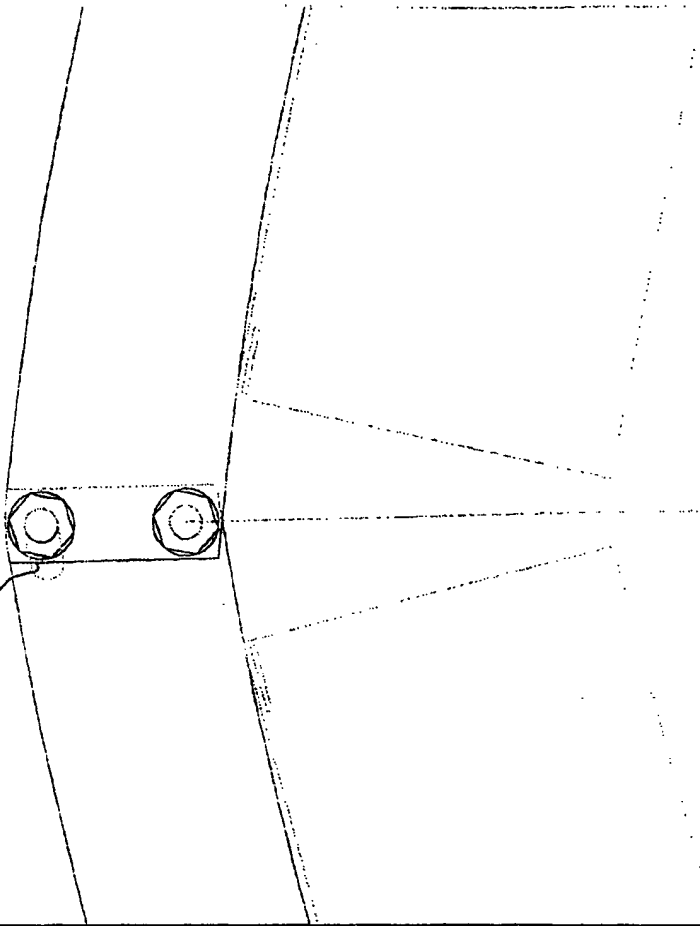


FIG 7

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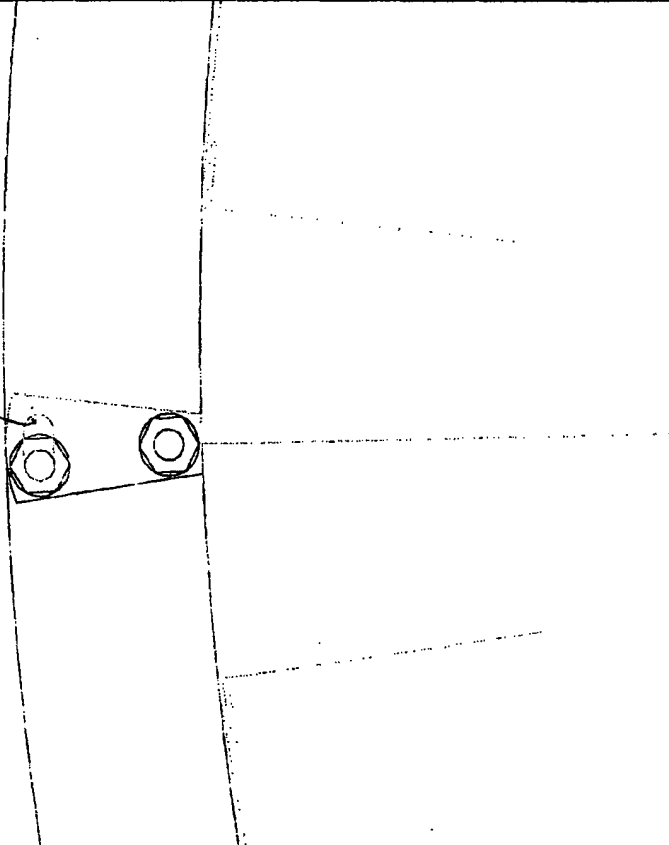
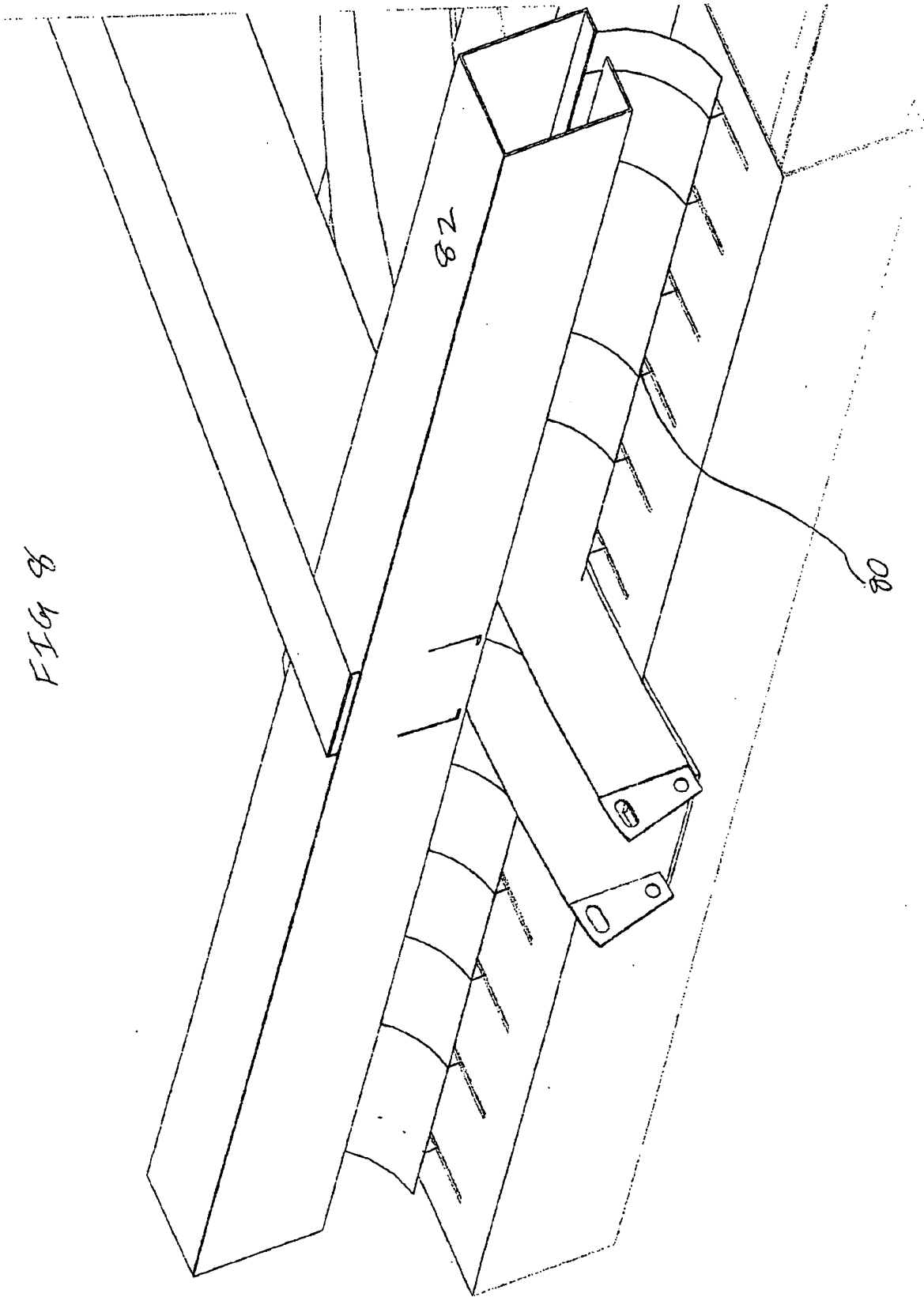
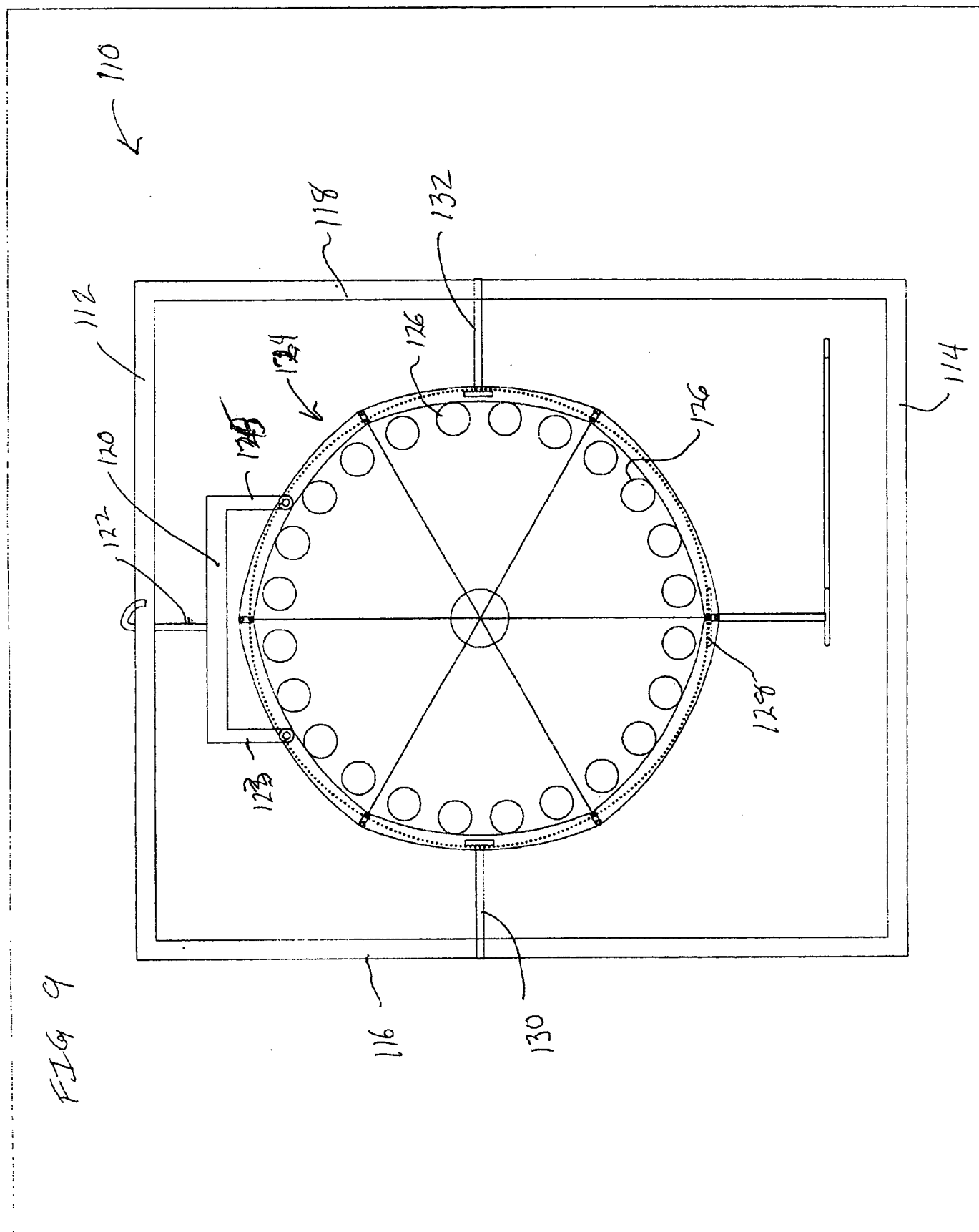
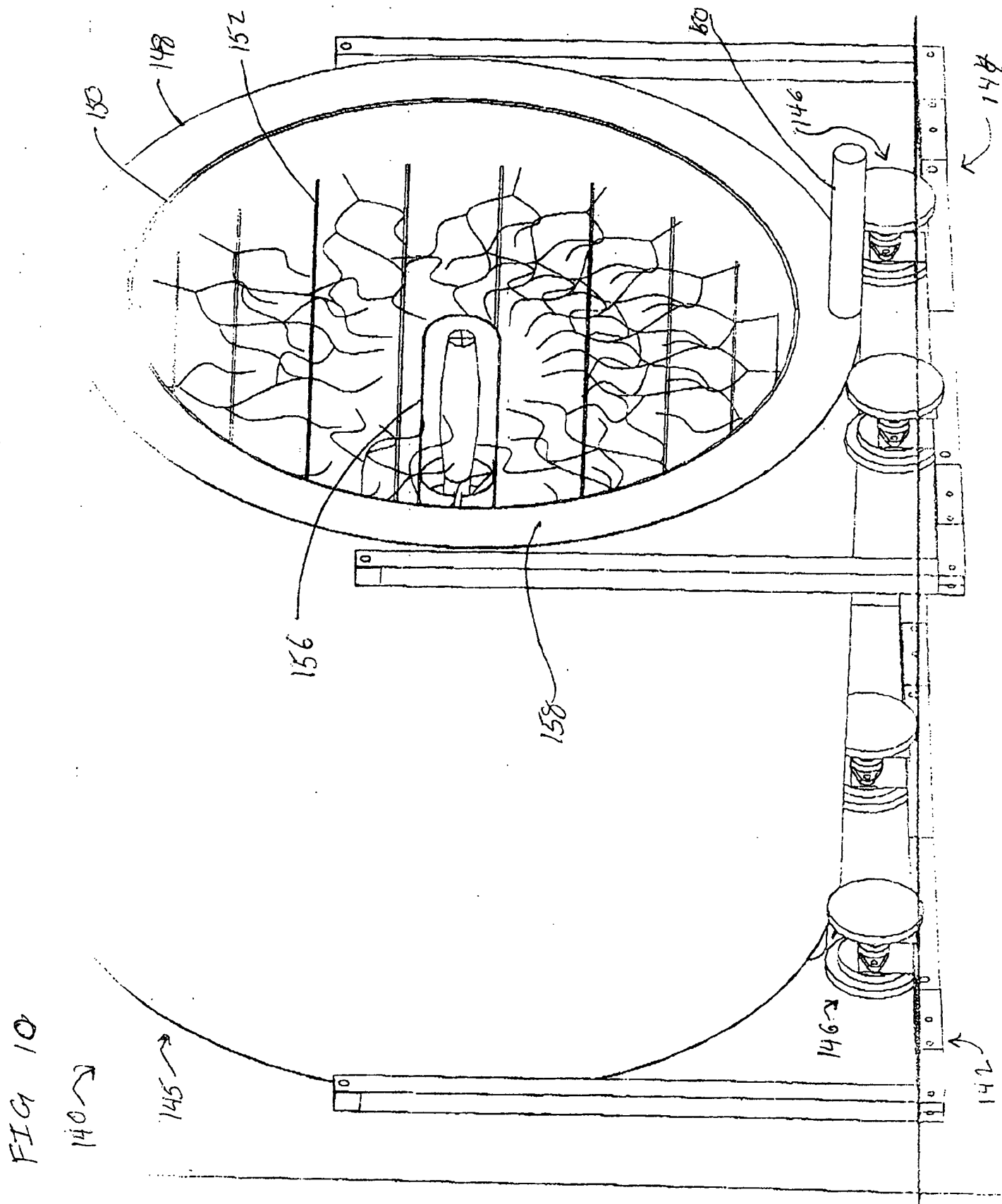


FIG 8







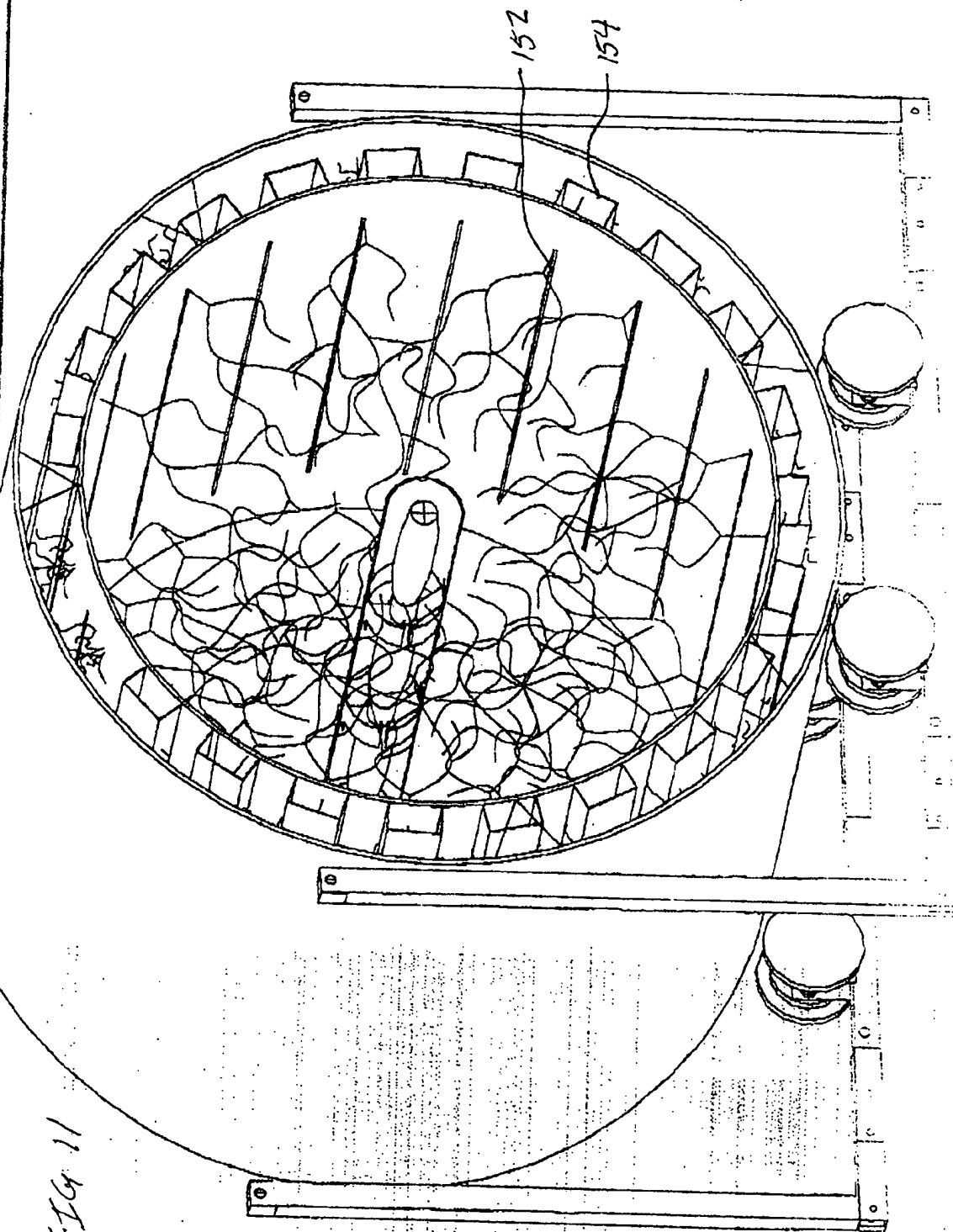


FIG 11

FIG 17:

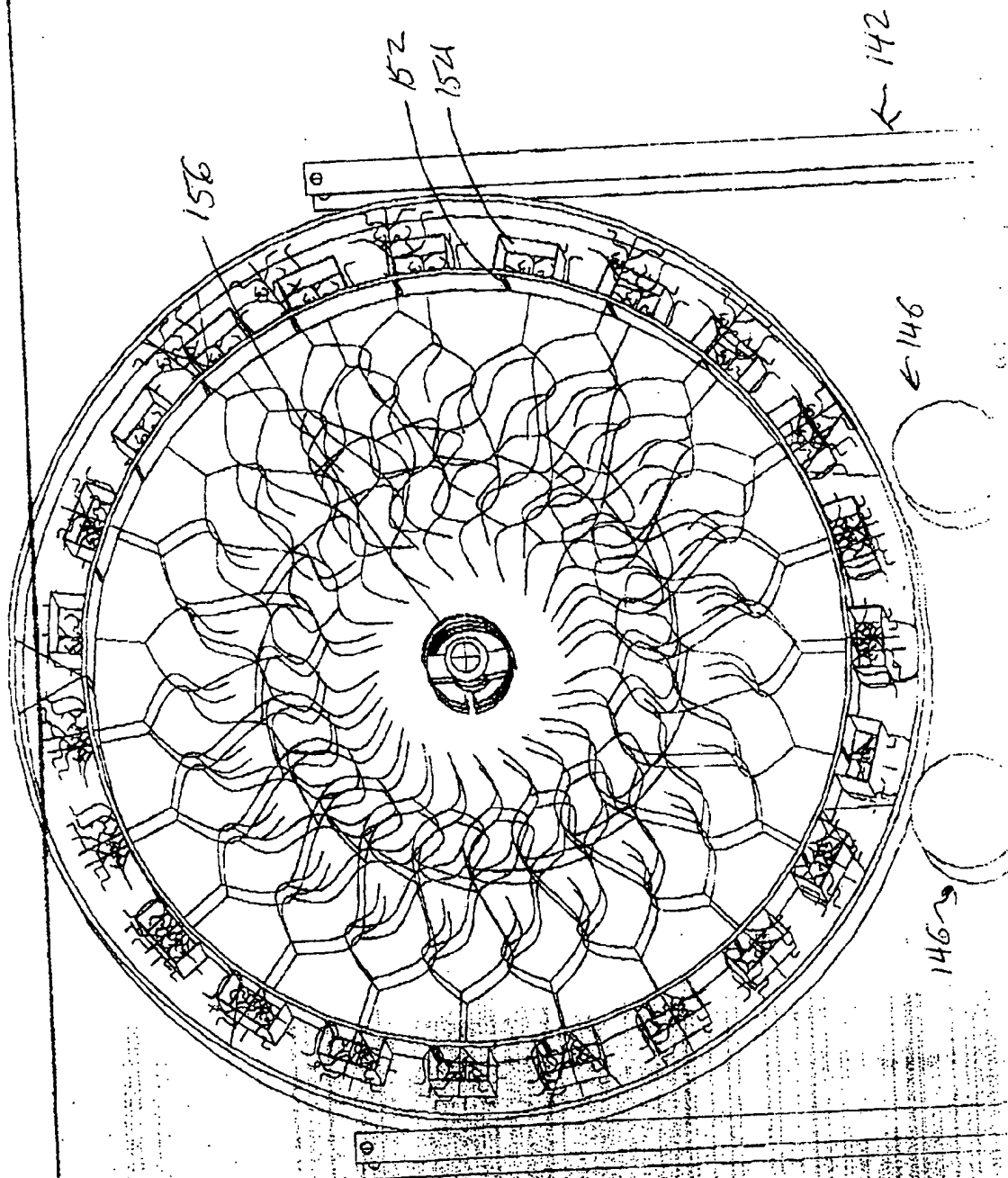


FIG 13

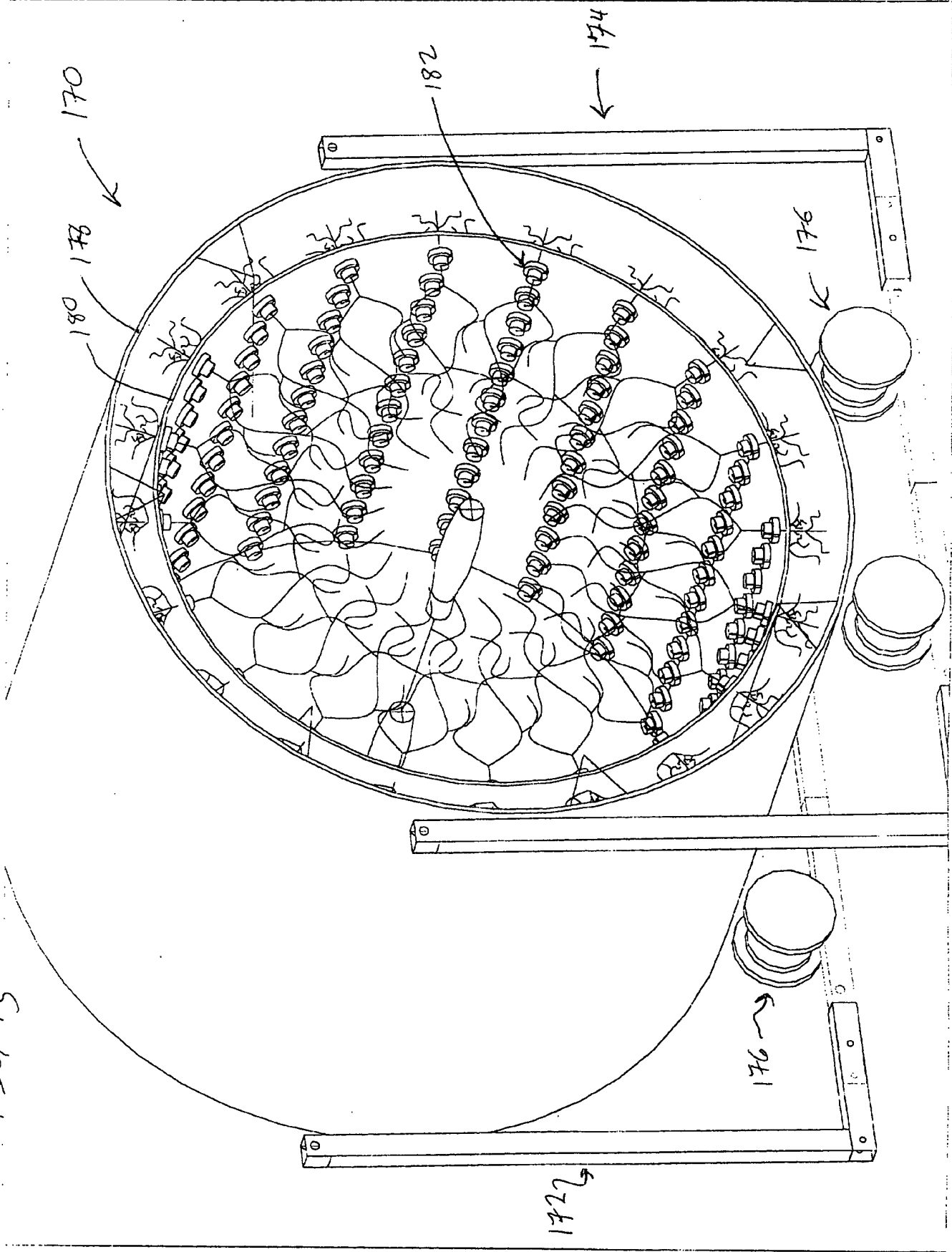


FIG 14

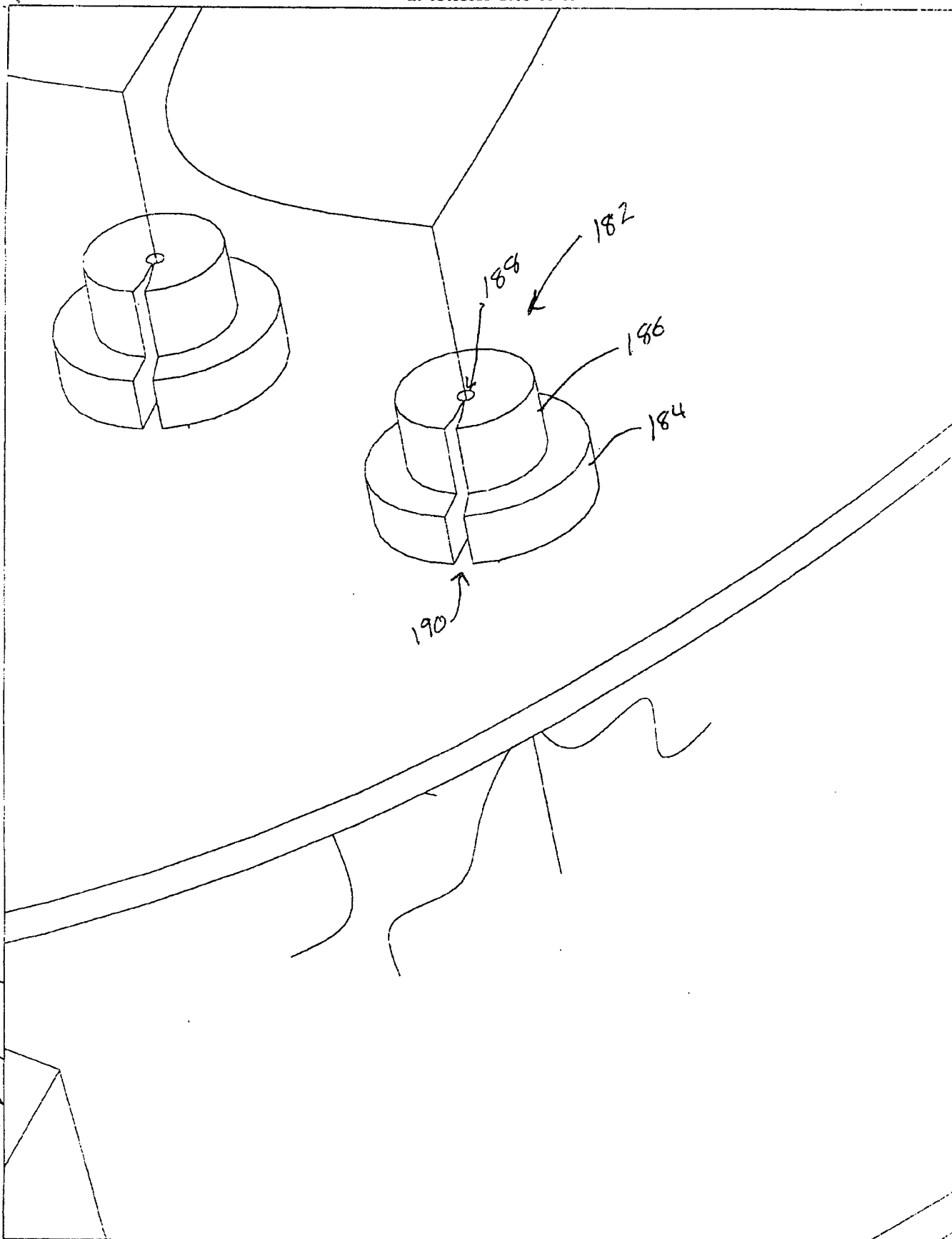
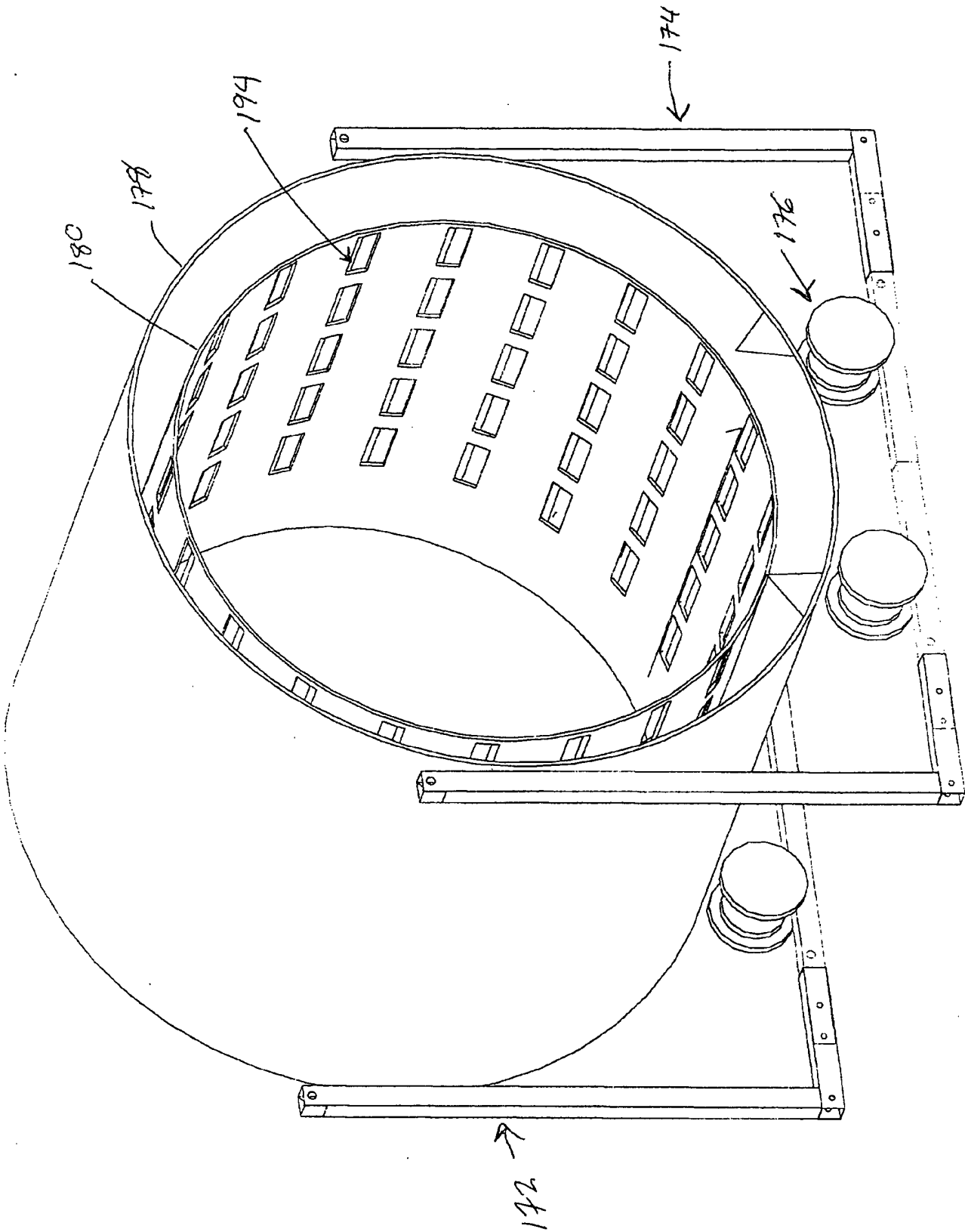
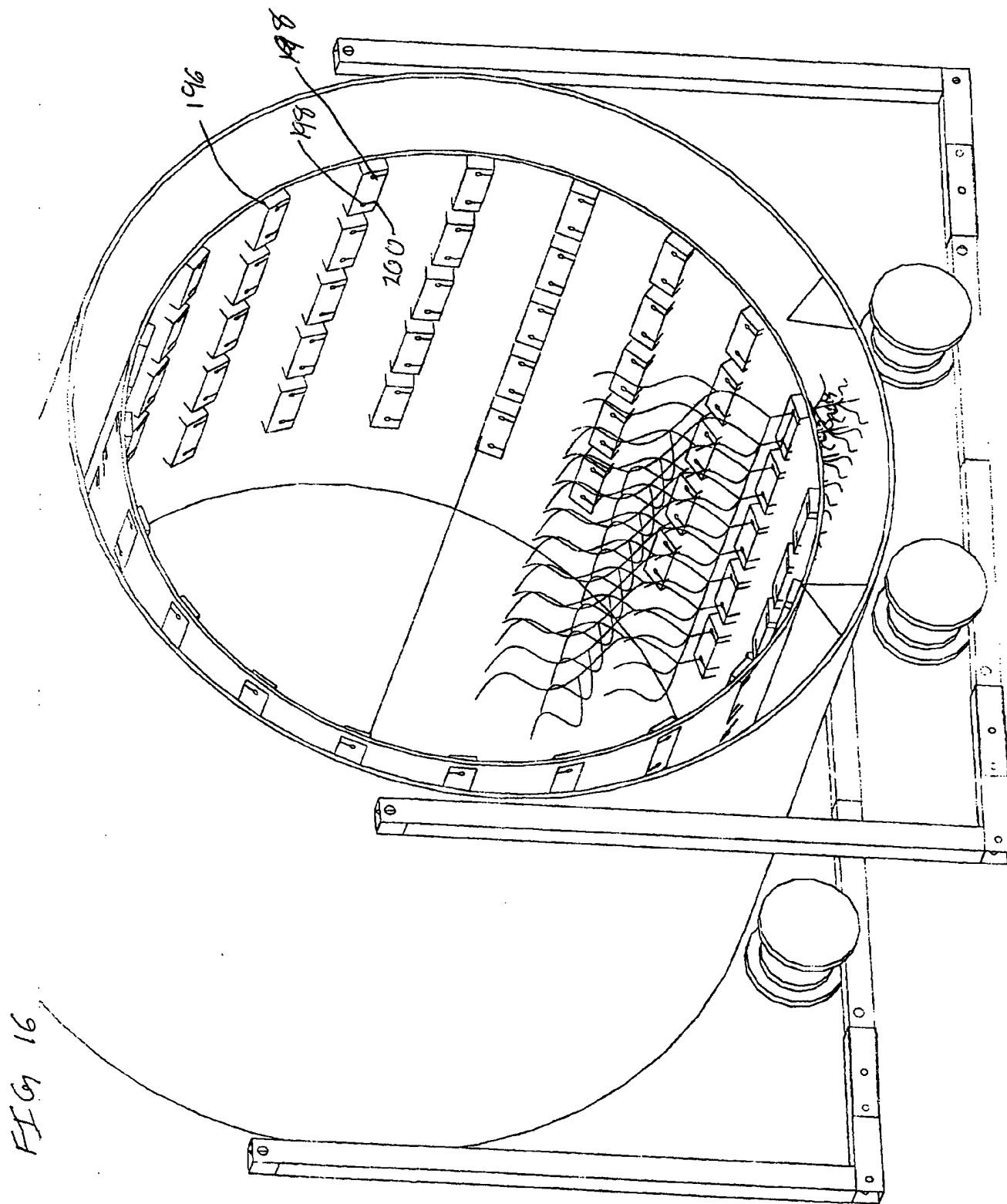


FIG 15





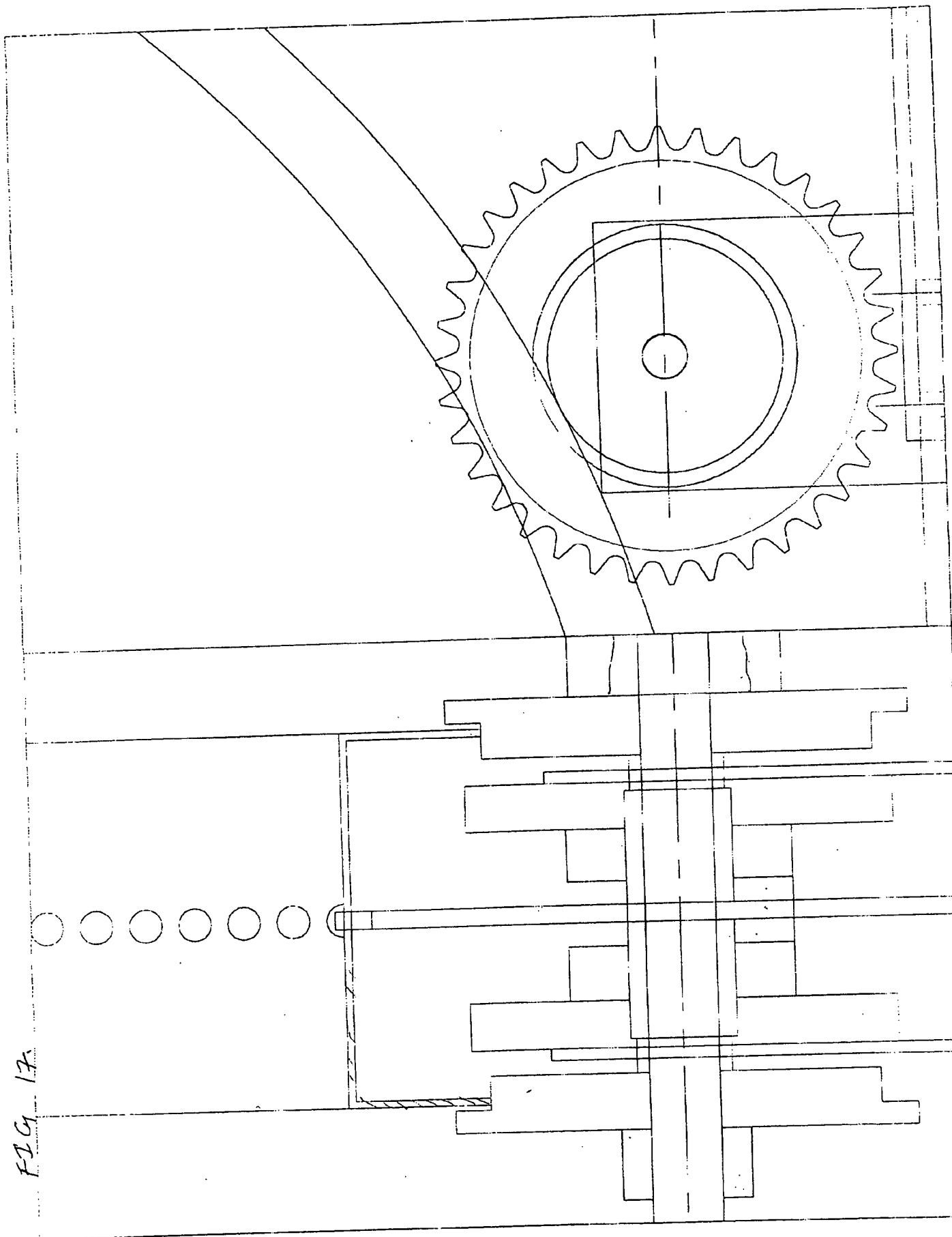


FIG. 17

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